

CLAIMS

1. A method in an access point (11) of a communication system (10), said access point (11) transmitting signals of data streams using a set of one or more antennas (A_1, \dots, A_M) to 5 a plurality of mobile terminals (MS_1, \dots, MS_k),

characterised by

determining (21) a set of spatial transport formats comprising for each format at least one or more vectors of complex transmission weights and delays, each vector 10 associated with the transmission of one of a determined signal of interest or one of a number of multiplexed co-channel signals and associated with a transmission power value of its associated signal, and whereby each vector element is associated with one antenna,

15 selecting a subset of said transport formats as the active set for data transmission to one or several of said mobile terminals,

signalling (23) said active set of transport formats to said one or several mobile terminals.

20 2. The method according to claim 1, whereby the norm of a vector represents the transmission power of the associated signal.

25 3. The method according to claim 1, whereby a scaling factor of a vector represents the transmission power of the associated signal.

4. The method according to one of claims 1-3, whereby the signalling (23) is performed over a common control channel that can be decoded by all users within the coverage area of the access point.

5. The method according to one of claims 1-3, whereby the signalling (23) is performed over a dedicated control channel which is transmitted over a part of the coverage area of the access point to a specific user.
- 5 6. The method according to one of the preceding claims, whereby the mobile terminals or groups of mobile terminals are assigned to different sets of transport formats.
7. The method according to one of the preceding claims comprising the step of advising the mobile terminals about a metric to be applied on selected downlink channel properties to derive a quality indicator for one or more of the transport formats.
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8. The method according to claim 7 comprising the step of advising the mobile terminals to provide quality indicators for the best or a set of best transport formats with respect to the applied metric.
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9. The method according to claim 7 or 8 comprising the step of advising the mobile terminals to provide quality indicators for the worst or a set of worst transport formats with respect to the applied metric.
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10. The method according to claim 7, whereby the applied metric is a signal-to-noise and interference ratio.
11. The method according to claim 7, whereby the applied metric is an estimate of the supported bit rate in terms of a channel encoding and modulation scheme.
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12. The method according to claim 1, whereby the number of weights for each antenna is the same.
13. The method according to claim 12, whereby only one complex weight and delay is assigned to each specific antenna.
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14. The method according to claim 1, whereby one fixed delay value is assigned to all the antennas.

15. The method according to claim 14, whereby the fixed delay value is not included in the signalling of the active 5 set of transport formats.

16. The method according to claim 1, whereby the access point further performs the steps of

adjusting transport formats of the active set by means of adapting (29) the parameters of their complex transmission 10 weights and/or their transmission power by means of evaluating (26) collected channel management information (22),

signalling (23) an indication of the adjusted transport formats to the one or several mobile terminals.

15 17. The method according to claim 16, whereby said received management information (22) includes mobile terminal determined quality indicators of the downlink channels associated to said transport formats.

20 18. The method according to claim 16 or 17, whereby said received management information (22) includes interference management requirements and/or indications of downlink channel statistics.

25 19. The method according to claim 16, whereby the selecting and adjusting of said transport formats optimises the aggregate data throughput subject to quality and fairness requirements.

20. The method according to claim 1, whereby the access point further performs the steps of

evaluating (26) a plurality of quality indicators received 30 from various mobile terminals and determining (24) the

applicable data rates for each of the data streams associated to the transport formats in the active set,

determining (24) from said evaluation a scheduling scheme and scheduling data streams to said mobile terminals,

5 assigning an applicable data rate to each of said scheduled data streams.

21. The method according to claim 20, whereby said scheduling scheme provides a fair access to the data streams.

10 22. The method according to claim 20, whereby the said scheduling scheme provides cyclic access to the data streams.

23. The method according to claim 20, whereby the scheduling scheme only provides access to the data streams if the
15 reported quality indicator is sufficiently good.

24. A method in a mobile terminal (MS_1, \dots, MS_k) of a communication system (10), said mobile terminal comprising one or more antennas (A_1, \dots, A_m) for receiving data streams from a multi-antenna access point (11),

20 characterised by

receiving (31) from the access point an indication of applicable spatial transport formats,

estimating (32) quality indicators for the received transport formats taking channel and interference conditions
25 into account,

transmitting (33) a quality report for one or several of the received transport formats, including a quality indicator for each of said formats.

25. The method according to claim 24, whereby a mobile terminal determines a quality indicator from a signal-to noise and interference ratio when applying the received transport formats.